



Fact Sheet



UNITED STATES AIR FORCE

377TH AIR BASE WING (AFMC)
Office of Public Affairs, Kirtland Air Force Base, NM 87117

505-846-5991

Mars Missions Flight

The Mars Missions Flight is the Air Force Research Laboratory La Luz Academy's classroom-based Mars colonization simulation for fifth graders.

It's based on the Challenger Center for Space Science Education's acclaimed *Marsville®*, the *Cosmic Village* program. The Mars Mission Flight has been modified to include Air Force technologies and terminologies to provide a unique hands-on learning opportunity for students. Students prepare for and simulate a manned mission to Mars to build a colony of habitats.



Photo by Howard Huttel

The La Luz Academy is on Kirtland Air Force Base, New Mexico.

The space exploration and colonization activities for this project combine math, science, engineering, communications and the arts and demonstrate problem solving and teamwork using a cooperative model. It also provides students with positive role models from the fields of science and technology.

The flight begins with a training workshop held in the fall where teachers are given information they need to implement the mission at their school. Teachers participate in the activities their students will complete, including hands-on construction of a scale-model Martian habitat and the life support systems used within.

Then teachers return to their classrooms to complete these activities, known as Base Operations, with their students. Students learn about the planet Mars and the special challenges it poses to human settlement, while applying engineering, technology and fine arts concepts. Teachers receive a monthly newsletter to keep them abreast of future events and deadlines.

- **Engineering Concept:** Students are formed into five- to seven-person teams with each group designing and constructing a model of a life support system to sustain the Martian colony.

These systems include air supply, communication, food production, recreation, temperature control, transportation, waste management and water supply.

- **Technology Concept:** Each student team is grouped with two other teams from different schools to form a habitat crew. Habitat crews are assigned three distinct math problems, one math problem per team, which provide clues to the longitude and latitude of their Mars colony location. Each team must telecommunicate through written or electronic means such as e-mail and fax with the other two teams in the habitat crew to obtain a complete set of math problems and their answers.

- **Fine Arts Concept:** Each student team is responsible for creating a mission patch which identifies team members and mission purpose. This team-building activity serves as a method of getting to know one another and emphasizes the goals of the mission. In addition, all teams in a classroom are asked to write a saga—a sung or spoken ballad, which can include choreography—describing their journey from Earth to Mars.



The flight ends in a Link-Up Day in the spring, where teams come together to simulate the Mars Mission. Each team progresses through a series of holding stations to ensure they have completed the necessary preparations for Link-Up Day, receiving points on a Team Mission Log as they do so. The holding stations include pre-cut plastic habitat pieces, life support system model, technical briefing, uniforms and telecommunications, pre-lunch check and saga performance.

After completing the holding stations, each team meets their fellow habitat crew members for the first time and constructs inflatable plastic habitats measuring 12' x 12' x 8'. Connecting tunnels are built between all of the habitats in the colony, but are kept closed for the time being.

Once construction is complete, teams enter the habitat and eat the Link-Up Day lunch they carefully prepared in advance so as to minimize space and weight, while meeting basic nutrition requirements. After lunch, students have the lunch waste weighed to verify minimal waste weight requirements have also been met.

Next, the students cut the connecting tunnels open, linking all of the habitats in the colony together. This is where the name Link-Up Day comes from. team members and invited guests then participate in a walk-through of the entire colony.

Student mentors participating in the Leadership Flight assist with the Mars Missions Flight as members of Mission Control during Link-Up Day.

For more information, contact AFRL La Luz Academy at 505-846-8042 or go to:
<http://www.vs.afrl.af.mil/TechOutreach/TT/K-12.aspx>

(Current as of October 2008)